

by Messrs. Longmans about six years ago,<sup>1</sup> it contains a great deal of practical information that should be of great service to those interested in coast protection.

One of the authors is the son of the late Mr. Case, so well known for the very successful work he carried out in protecting and saving from destruction the coast land at Dymchurch, and afterwards for his advocacy of the system of low groynes.

The book is divided into fourteen chapters, dealing respectively with forces acting on coasts and the sea bed, transporting power of running water, movement of materials composing the foreshore and bed of the sea, causes of erosion, protection works, materials of construction, groynes, sea walls, sand dunes.

The authors very properly point out that there is no one method of protection that can be applied to all coasts, but that each shore must be considered on its merits, and that it is only after due consideration has been given to the special circumstances which may influence the effect of the sea upon any particular shore that the proper remedy can be designed.

By way of example, it has been frequently said that it is useless to erect groynes upon a foreshore where there is no material to collect. But there are other matters that require consideration besides the actual collection of material. On many sandy coasts low groynes may serve a useful purpose by preventing denudation and the formation of swills and lows.

With regard to the sometimes debated question of high and low groynes, the writers of this book are fully in accord with the author of "The Sea Coast" in advocating the use of low groynes both on account of efficiency, convenience, and economy. With regard to the direction to be given to groynes, the authors do not see any reason for departing from a direction at right angles to the shore, and the majority of the engineers who gave evidence before the Royal Commission on Coast Erosion were of the same opinion, although some stated that, as a matter of experience, they had found the best results were obtained where the groynes were directed away from the side from which the prevailing winds came.

As to the proper distance between groynes, this has been found by the experience of the authors to be the distance between high and low water mark, or practically the length of the groyne. Experience has fully shown that the carrying up of the groyne from low water to about half tide level, as practised in many instances by the late Mr. Case, is not sufficient, as the water is apt to work round the end and make gullies, but that in every instance the groynes should extend so far as the high spring tides reach.

The chapter on ferro-concrete groynes contains much useful information on the application of this material to sea defence work, and gives illustrations and cost of works carried out for the protection of the coast of Sussex. The cost of these groynes is given as twenty shillings a foot run, which compares favourably with timber.

<sup>1</sup> "The Sea Coast, Destruction, Littoral Drift, Protection." (London: Longmans and Co., 1902.)

## OUR BOOK SHELF.

*The Discovery and Settlement of Port Mackay, Queensland.* By H. Ling Roth. Pp. viii+114; 82 figs., 4 maps and charts. (Halifax: F. King and Sons, Ltd., 1908.)

PORT MACKAY in Queensland was discovered by Captain Mackay in 1860. The town was founded in 1862, and declared a port of entry in 1863, and is now the chief seat of the sugar industry in Queensland. The early history of a colonial settlement is sometimes of great interest, but it is often impossible to recover it, excepting where, as fortunately is usually the case in Australia, the young town promptly establishes a local newspaper. Port Mackay had the advantage of including amongst its residents Mr. H. Ling Roth, the author of the standard work on the aborigines of Tasmania; he was at one time secretary of the Mackay Sugar Planters' Association, and in this volume gives a monograph of the history of the town up to 1867, whence the story is continued in the columns of the local Press. He describes the discoveries along the Queensland coast up to 1844, and the exploration of the coastal districts by land from 1813 to 1859; and he explains how it happened that so valuable a locality as Port Mackay was missed by all explorers until 1860.

The volume is most valuable as a contribution to the historical geography of Australia. It includes a collection of portraits and interesting sketches of the early settlers. It tells several good stories, as of the sarcastic Mackay magistrate, who, when joined on the bench by a distrusted local J.P., asked his colleague whether he appeared for the plaintiff or the defendant. In the appendices, Mr. Ling Roth gives a valuable account of the aborigines of the district and of its natural history. He objects to calling the black-fellows aborigines, as he holds that Australia was first occupied by a negroid people who have been supplanted by the present race. This view, well known from its adoption by Sir William Flower, appears to be now generally discredited, owing to the lack of evidence in its support. The author undertakes a forlorn hope in his objection to Australian lizards being called Iguanas—often abridged to "Goanas"—because they do not belong to the genus *Iguana* as now restricted. The name may conveniently be retained popularly for the lizards formerly included in the Iguanidæ, and it is not so incorrect zoologically as those of "native bear" or native "cat."

There are specially interesting notes on the habits of some of the snakes and of the crocodiles, and the author appears disposed to throw doubt on the established habits of crocodiles of other continents from the different behaviour of the sluggish Queensland *Crocodilus porosus*.

Stories are often told of the wanton extermination of the Australian aborigines by the colonists. It is interesting, therefore, to learn from Mr. Roth that a collector on the coast from 1863 to 1873 endeavoured in vain to get an aboriginal skeleton for a well-known European museum. His failure shows that at least in the Port Mackay district there is no truth in the legends about the wholesale shooting of the aborigines. J. W. G.

*Through the Depths of Space.* A Primer of Astronomy. By Hector Macpherson, jun. Pp. viii+123; illustrated. (Edinburgh and London: William Blackwood and Sons, 1908.) Price 2s. net.

In this small primer the author has attempted to give an outline of all the main features of the solar system, comets and meteors, and the stellar universe. As a journalistic collation the result is not without merit, but as a "primer," presumably for persons previously

unacquainted with astronomy, we fail to recognise the need for, or the suitability of, it. Having attempted too much in too little space, the author is in places forced to be dogmatic, in others he is inexplicit, and the beginner will find tabular statements which, without external assistance, will puzzle him.

To a fair extent the book consists of quotations from well-known writers fitted together with such statistics as one usually finds in popular articles; where the writer's personality appears, we find either dogmatic statements or information which is too loosely or too briefly explained. For example, on p. 28 the reader is told that in 1882, 1893 and 1905, "the disc of the sun was covered with spots"; the subsequent explanation of spot zones will but tend to confuse the beginner. In the next paragraph we read that Sir Isaac Newton showed that if "light" be passed through a prism, a band of coloured light, "known as the solar spectrum," is produced, a statement which can only convey the truth when the beginner either assumes, or knows, that it was the light of the sun that Newton employed. These examples will suffice to show that, in attempting too much, the author has occasionally lost sight of the fact that he was intending to write a book for beginners. Seven reproductions of celestial photographs and drawings illustrate the volume, some of them being from Prof. Max Wolf's beautiful originals.

W. E. ROLSTON.

#### LETTERS TO THE EDITOR.

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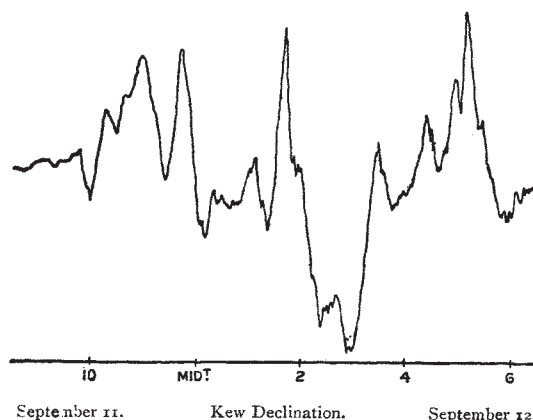
##### Large Magnetic Storm.

ON September 11-12 a large magnetic storm was experienced at Kew. There were minor disturbances earlier in the month, from September 4-6 and from September 8-10, and the magnetic traces were by no means absolutely quiet when the storm began. The commencement is, however, clearly indicated in the horizontal force curve (not reproduced). Starting at about 9h. 47m. p.m. on September 11, there was a very sudden change in the force. The movement of the horizontal-force magnet was of a type which not unusually ushers in large storms, but it was exceptionally large, representing an increase of about 112  $\gamma$  in H ( $1\gamma \equiv 0.00001$  C.G.S. unit) in less than two minutes of time. At the end of this movement H had reached its maximum during the storm. The first movement was followed by oscillations. A very rapid fall exceeding 300  $\gamma$  took place between 11h. 35m. p.m. and midnight; followed by an equally rapid but smaller recovery. The other principal changes in H occurred between 1 a.m. and 2 a.m., and between 4.40 a.m. and 6 a.m. on September 12. Between 4.40 a.m. and 5.7 a.m. there was a fall of 300  $\gamma$ . The extreme range was not shown on the curve, which went off the sheet, but it exceeded 500  $\gamma$ . Later on September 12, between noon and 7 p.m., there was further disturbance of a much less striking character, but this was probably from a distinct origin, and the storm commencing on September 11 may be regarded as terminating about 9.30 a.m. on September 12. On this view, the immediate result was a diminution of about 100  $\gamma$  in the value of H. Such temporary depressions in H are the usual legacy of magnetic storms, but the depression in the present instance seems above the average.

The declination curve, of which a tracing is reproduced on a reduced scale, shows the commencement about 9.47 p.m. on September 11 much less prominently. A small but sharp upward movement, representing an increase of about 1' in westerly declination, is, however, visible, followed in the course of the next twelve minutes by an easterly movement of about 13'. The most salient features

are the four peaks or turning points, where a prominent movement to the west terminated, and was followed by a similarly prominent movement to the east. The approximate times answering to these peaks are 11.4 p.m. and 11.44 p.m. on September 11, and 1.46 a.m. and 5.14 a.m. on September 12. The extreme easterly position was reached at about 2.53 a.m., and the extreme westerly position at about 5.14 a.m. on September 12, the total range of declination being about 1° 27'. The movements on September 12 were the most rapid. Between 1.24 a.m. and 1.46 a.m. there was a westerly movement of about 51', followed in the course of the next eight minutes by an easterly movement of about 35', while between 2.58 a.m. and 3.28 a.m. there was a westerly movement of about 53'. There were no large movements after 6 a.m.

The vertical force disturbance was of a somewhat unusual type. Whilst there was a certain amount of oscillation, the principal feature was that during the whole duration



of the storm—from 9.47 p.m. on September 11 to 9.30 a.m. on September 12—the vertical component, V, was depressed below its normal value. The extent of the depression may be judged from the fact that from 11.45 p.m. on September 11 to 6.10 a.m. on September 12—i.e. for more than six hours—V did not rise to within 150  $\gamma$  of the value which it possessed when the storm commenced. By 9 a.m., however, on September 12, V had returned to its normal value. Owing to loss of trace, the extreme range of the vertical force disturbance was not recorded.

C. CHREE.  
Observatory Department, National Physical  
Laboratory, September 14.

##### Bouvet Island and the Solar Eclipse of 1908 December 22-23.

A QUESTION having been raised as to whether the total phase of this eclipse will be visible at Bouvet Island, I have asked the Hydrographic Department for the most trustworthy coordinates of the island with the view of a settlement of the matter.

The position adopted for Bouvet Island on the Admiralty chart of the region is 54° 22' S., 5° 21' E.

Adopting the elements of the *Nautical Almanac*, the eclipse of next December for this position is a partial one, the magnitude (sun's diameter=1) being 0.988. The island is about 10' south of the southern limit of the zone of totality.

A. M. W. DOWNING.  
H.M. Nautical Almanac Office, September 17.

##### Ruthless Extermination.

HAVING noticed in your issue of September 3 a most interesting article on the subject of the extermination of animals in Africa, I cannot say how indignant I feel that there should be persons who actually advocate the wholesale destruction—by international consent—of the many wonderful species which have been built up in their perfection during countless ages of evolution.